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(54) Magazine-housed disk player.

EP 0 265 167 A3 (57) A magazine-housed disk reproducing apparatus is disclosed which enables the user to easily determine the contents of the various disks contained in the magazine. The names of tunes and the like provided on the various available disks are stored in a memory. An identifying device detects which magazines containing which disks have been loaded. A display device is activated to indicate to the user the desired content information.

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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
X Y A	GB-A-2062935 (NSM APPARATEBAU GMBH & CO. KG.) " page 1, line 111 - page 2, line 75 "	1 2 3, 5, 7-9	G11B27/00 G11B17/22 G11B23/30 G11B27/34
Y A	PATENT ABSTRACTS OF JAPAN vol. 10, no. 250 (P-491)(2306) 28 August 1986, & JP-A-61 077184 (TOSHIBA CORP.) 19 April 1986, " see the whole document "	2 1, 7, 9	
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Y	PATENT ABSTRACTS OF JAPAN vol. 7, no. 160 (P-210)(1305) 14 July 1983, & JP-A-58 68278 (NIPPON KOKUYU TETSUDO) 23 April 1983, " see the whole document "	4	TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 16 JUNE 1989	Examiner DAALMANS F.J.
CATEGORY OF CITED DOCUMENTS			
X particularly relevant if taken alone Y particularly relevant if combined with another document of the same category A technological background U non-written disclosure P intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons A : member of the same patent family, corresponding document	

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DOCUMENTS CONSIDERED TO BE RELEVANT

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A	FR-A-2517863 (MOULENE) " the whole document "	1, 3, 5-9	
A	US-A-4538253 (ISHIBASHI ET AL.) " the whole document "	1, 3, 7, 10	
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Place of search THE HAGUE		Date of completion of the search 16 JUNE 1989	Examiner DAALMANS F. J.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons A : member of the same patent family, corresponding document</p>			

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(57) Magazine-housed disk player.

A magazine-housed disk reproducing apparatus is disclosed which enables the user to easily deter-

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MAGAZINE-HOUSED DISK PLAYER

BACKGROUND OF THE INVENTION

The present invention relates to a magazine-housed disk player

A magazine-housed disk player has recently been developed in which a plurality of disks on which audio information, video information or the like is recorded are housed in magazines, and one of the disks is selected for reproduction. For example, a magazine shown in Fig. 1 can house several compact disks on which about 120 tunes can be recorded if the reproduction time of each of the tunes is about 3 minutes. Therefore, it is easy to store many relatively short tunes such as jazz and popular music all in the same magazine.

For the magazine-housed disk player, a reproduction program indicating the sequence of reproduction is created before reproduction is commenced to continuously reproduce loaded tunes in accordance with the reproduction program, providing convenience to the user. However, when the user wants to know the contents of the disks housed in the magazine, he or she must take out the disks for confirmation or previously make a memorandum of them. If a plurality of programs are stored in the player, it is necessary to know the reproduction program corresponding to the magazine. Therefore, it is desired to improve the way of enabling the user to know the contents of the disks housed in the magazine and the reproduction program corresponding to the magazine.

Moreover, in a conventional magazine-housed disk player, it is necessary every time a magazine is replaced by another for the production program to be set again depending on the tunes carried by the disks in the magazine. If a plurality of reproduction programs are stored beforehand, it is necessary to determine the contents of the disks housed in each magazine to select one of the reproduction programs. For these reasons, it is troublesome to perform such operations when a plurality of magazines are used for the conventional magazine-housed disk player or a magazine is jointly used for a plurality of such magazine-housed disk players.

In a device proposed by the present applicant, magazines are provided with identification marks. The contents (such as the titles of tunes) of disks housed in each of the magazines are previously stored in a memory provided in a magazine-housed disk player. When the magazine is loaded in the player, the identification mark of the maga-

zine is read to identify the magazine to display the contents of the disks housed in the magazine. It is thus made convenient for the user of the player to perform tune selection or the like

Although tune selection is made easy by displaying the contents of the disks housed in the magazine, it is not necessary until the end of the reproduction of the selected tune to display the title of the selected tune after the reproduction thereof is started.

There is a desire to display image information (which is hereinafter referred to as tune content information) related to the lyrics of the tunes on the disks housed in the magazine, an explanatory sentence for the tune, an imaginal picture for the tune and so forth.

Fig. 2 shows a front view of a magazine 607 in which a plurality of optical disks 601, 602, 603, 604, 605 and 606 are housed in a stacked state for a conventional disk player

Fig. 3 shows a front view of the disk player having a tray 608 in which the magazine 607 is housed, operation keys 601 and 611, and a display panel 610.

The operation of the disk player with the optical disks 601, 602, 603, 604, 605 and 606 housed in the tray 606 will now be described. As shown in a block diagram in Fig. 4, the playback operation key 609, which is one of the operation keys, a remote controller or the like is operated to select a desired disk. The selected disk is moved to a disk playback position. Only a lead-in area is provided with a portion for a track number 00. Program information is read and stored in a program memory by the operation of the keys and the reading of a table of contents (which is hereinafter abbreviated as TOC), which serves to determine a format to create a list of contents of the disks by changing the time items of the portion for the track number 00. The reproduction of the disk in the disk playback position is started on the basis of the program information stored in the program memory. The TOC remains stored as long as the magazine 607 is loaded in the tray 608 and electric power is applied to the disk player. The program information remains stored unless a clear key 609 is operated.

When two magazines A and B each containing one or more disks are to be reproduced in a predetermined sequence by the above-described conventional disk player, the magazine A is first loaded in the tray 608 to reproduce the disks in the magazine in accordance with a set program, and the other magazine B is thereafter loaded in the tray to reproduce the disks in the magazine. In that

Each of the magazines is identified at the time of reproduction in terms of the TOC information or the like on the disks housed in the magazine, so that the reproduction is automatically performed in accordance with the preset program which does not need to be set again every time the reproduction is performed.

In a still further embodiment of the present invention, there is provided a disk player in which operation keys for entering the numbers of magazines and a display section for showing the magazine numbers entered by the operation keys are provided to enter information on a plurality of magazines and to indicate the number of each magazine when it is loaded in the player.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows an example of a magazine-housed disk reproducing apparatus;

Fig. 2 is a front view of a magazine containing conventional disks;

Fig. 3 shows a front view of a disk reproducing apparatus in which the magazine shown in Fig. 2 is loaded;

Fig. 4 is a block diagram of a process from the loading of a conventional magazine in a disk reproducing apparatus to the reproduction of a disk in the magazine;

Fig. 5 is a perspective view of a magazine for a disk reproducing apparatus;

Fig. 6 is a block diagram of a magazine-housed disk reproducing apparatus constructed in accordance with a first embodiment of the invention;

Figs. 7A and 7B are diagrams used for explaining a bar code reader;

Fig. 8 is a flowchart describing the control operation of the magazine-housed disk reproducing apparatus of Fig. 6;

Figs. 9A to 9E show examples of displayed images;

Fig. 10A shows an example of a magazine for a magazine-housed disk reproducing apparatus constructed in accordance with a second embodiment of the invention;

Figs. 10B, 10C and 10D show examples of identification mark detection devices;

Fig. 11A shows another example of a magazine for a magazine-housed disk reproducing apparatus;

Figs. 11B to 11G show other examples of identification mark detection devices;

Figs. 12A to 12C show still other examples of a magazine for a magazine-housed disk reproducing apparatus;

Fig. 13 is a block diagram of the magazine-housed disk reproducing apparatus of the second embodiment of the invention;

Fig. 14 is a flowchart for describing the operation of a system controller in Fig. 13;

Figs. 15A and 15B show examples of magazines for a magazine-housed disk reproducing apparatus of a third embodiment of the invention;

Figs. 16A and 16B show examples of variable characteristic circuits;

Fig. 17 is a block diagram of the magazine-housed disk reproducing apparatus of a third embodiment of the invention;

Fig. 18 is a flowchart for describing the operation of a system controller in Fig. 17;

Fig. 19 shows a magazine-housed disk reproducing apparatus of a fourth embodiment of the invention;

Figs. 20 to 20C illustrate entry through a bar code reader;

Figs. 21A to 21C are flow charts for describing control operations of the reproducing apparatus of the fourth embodiment;

Figs. 22A and 22B show examples of displaying data;

Fig. 23 shows a magazine-housed disk reproducing apparatus constructed in accordance with a fifth embodiment of the invention;

Fig. 24 is a block diagram of the magazine-housed disk reproducing apparatus of Fig. 23;

Fig. 25 is a flowchart used for describing the control operation of the system controller shown in Fig. 24;

Fig. 26 is a block diagram of a magazine-housed disk reproducing apparatus constructed in accordance with a sixth embodiment of the invention;

Fig. 27 is a flowchart for describing the control operation of the system controller shown in Fig. 26;

Fig. 28 illustrates a process in which disk information and program information are stored in a disk reproducing apparatus of a seventh embodiment of the invention;

Fig. 29 illustrates a process in which a loaded magazine is identified in terms of the information stored in the process of Fig. 28 and in which program information stored in the loaded magazine is read;

Fig. 30 is a flowchart of a process in which a magazine is automatically identified in terms of specific information on a disk;

Fig. 31 and Fig. 32 are flowcharts showing reading and writing in a process in which table of contents information is sequentially read during reproduction.

The operation of the system controller 3 is now described with reference to a flowchart shown in Fig. 8A. When electric power is applied to the magazine-housed disk player, the execution of a main control program (not shown in the drawings) is started. After the initial portion of the main control program is executed, a subroutine is executed to read the output from the loading detector 2a to judge whether or not a magazine is loaded in the player, in a step S1. If the magazine is still not loaded, such is shown on the display panel 36 in a step S2, indicating that the magazine should be loaded in the player. The identification mark reading circuit 2 reads the identification mark of the already loaded magazine and supplies the magazine identification unit 31 with an output corresponding to the identification mark. The number of the already loaded magazine is detected by the magazine identification unit 31 in terms of the output. The number of the magazine is entered in a step S3. It is then judged in a step S4 whether or not display information corresponding to the number of the magazine is stored in the internal or external memory 10. When it is judged in the step S4 that the display information is not stored in the memory 10, unregistered display data are entered from the ROM 35 in a step S5 to show that the display information corresponding to the number of the magazine is not stored in the internal or external memory 10. The unregistered display data are then supplied to the display control circuit 20 in a step S6. Upon receiving a display command in a step S9, the display control circuit 20 acts to show the data on the CRT 22.

When the display information corresponding to the number of the magazine is judged to be stored in the internal or external memory, in the step S4, the display information is entered in a step S7. As mentioned above, the display information includes a reproduction program corresponding to the magazine, the titles of tunes, memoranda, etc. After the display information is supplied to the display control circuit 20, a display command is given in steps S8 and S9. The display control circuit 20 acts to temporarily store the display information and to sequentially convert the display information into image information by the character generator 21 and supply the image information to the CRT 22 in accordance with the display command. The contents of the magazine are thus shown on the CRT 22 so that the execution of the subroutine is terminated and that of the main control program is resumed.

Fig. 9A shows an example of displaying of titles of tunes contained in the magazine. In a manual operation mode, one of such tunes is selected. Shown at TNO, IND and TIME in Fig. 9A

are a track number, an index number, and a reproduction time, which are displayed on the CRT 22 in accordance with a control program (not shown).

In the main control program, a programmed reproduction mode or the manual operation mode is selected to start reproduction. When the programmed reproduction mode is selected, the reproduction program and the display information for the program are entered from the memory 10 during the execution of the main control program so that the titles of tunes are displayed in the sequence of reproduction, as shown in Fig. 9C. During reproduction, a subroutine shown in Fig. 8B is executed so that currently reproduced tune information indicative of the absolute address of a currently reproduced tune or the title thereof is entered from the reproduction control circuit 6 in a step S1. Display information corresponding to the currently reproduced tune information is entered from the memory 10, mixed with color information or the like and supplied to the display control circuit 20 in a step S2, and a display command is thereafter given to the display control circuit in a step S3. For example, if the currently reproduced tune is "SUITE 1 IN E MINOR", the color of the title of the tune displayed on the CRT 22 as shown in Fig. 9A and 9C is made different in value or the like from those of the titles of other tunes to emphasize the title of the currently reproduced tune. The title of the currently reproduced tune may be displayed in a larger size as shown in Fig. 9B, instead of making the color different.

Since the number of all tunes put in each magazine may be so large that it is difficult to display the titles of all tunes within a single frame, a scrolling display method may be adopted, as shown in Figs. 9D and 9E.

Not only the titles of tunes but also the names of the performer, the date of recording, and so forth may be displayed on the CRT 22.

In a magazine-housed disk player provided in accordance with the present invention, the contents of disks housed in a magazine are sent out in the form of image signals when the magazine is loaded in the player, so that the contents of the disks are displayed on an appropriate display unit such as a cathode-ray tube or on a display surface provided on the player. Therefore, it is easy to confirm the contents of the magazine.

A second embodiment of the present invention, which is a magazine-housed disk player, will hereafter be described with reference to the drawings.

Fig. 10A shows a magazine for the magazine-housed disk player. The end of the body of the magazine is provided with a plurality of notches so that a group of projections are formed. The projections can be optionally cut off. Normally, one of

given through the keyboard 207 the display unit 211 is commanded in a step S9 to display a request for the creation of the reproduction program to enter the program through the keyboard 207. When the completion of the creation of the reproduction program is entered through the keyboard 207 in a step S10, it is judged whether or not a storage command for storing the reproduction program in the memory 208 is given through the keyboard 207. When it is judged in a step S11 that the storage command is given through the keyboard 207, the reproduction program is stored in the memory 208. The reproduction program includes identification information which indicates that the program corresponds to the magazine N (in a step S12). When storing the reproduction program in the memory 208 is completed or the reproduction program is not stored in the memory, the reproduction program is executed in the step S7.

When it is judged in the step S8 that a new reproduction program creation command is not given through the keyboard 207, the player is put in another reproduction mode such as a manual reproduction mode in a step S13.

Reproduction programs can thus be previously created for a plurality of magazines and stored in the memory to automatically execute the reproduction program corresponding to the magazine loaded in the magazine-housed disk player.

As described above, the contents of each identification mark can be optionally altered to store a plurality of reproduction programs for a single magazine. For that reason, a desired reproduction program can be easily selected among the other reproduction programs by setting the contents of the identification mark in accordance with the desire of the user of the player.

The present invention is not confined to the above-described identification marks but may be otherwise embodied to provide identification marks such as a punched hole.

In a magazine-housed disk player provided in accordance with the above embodiment of the present invention, identification marks are previously provided in prescribed positions on magazines, and the contents of each of the identification marks are read to perform disk reproduction in a manner corresponding to the read contents. For that reason, a reproduction program does not need to be newly set for each magazine every time it is replaced by another. Therefore, disk reproduction can be quickly started in a predetermined manner.

Another embodiment of the present invention, which is a magazine-housed disk player, will hereafter be described with reference to the drawings.

Fig. 15A and 15B show examples of magazines in each of which a variable characteristic circuit 305 is provided. For instance, the variable characteristic circuit 305 is made of a plurality of switches as shown in Fig. 16A. The switches may be digital switches such as a DIP switch. If the number of the switches is n , n^2 magazines can be identified. When each of the magazines is loaded in the magazine-housed disk player, the output terminal of the variable characteristic circuit 305 is connected to a connection terminal provided in the player so that the output from the variable characteristic circuit is supplied to a characteristic detection circuit 306. As a result, the characteristic detection circuit 306 generates an identification signal corresponding to the output from the variable characteristic circuit and supplies the identification signal to a system controller 304 (not shown in Figs. 15A, 15B, 16A and 16B).

Fig. 16B shows another type of a variable characteristic circuit 305 in which the tap of a voltage divider circuit is shifted. The level of the voltage divider output from the voltage divider circuit is converted into an identification signal by an A/D (analog/digital) converter provided in the characteristic detection circuit 306.

The present invention is not confined to the above-described variable characteristic circuits 305, but may be otherwise embodied to provide a different variable characteristic circuit so long as the output from the circuit is unique for a corresponding magazine.

The constitution and operation of the magazine-housed disk player for reproducing disks housed in the magazine having the variable characteristic circuit 305 are now described with reference to Fig. 17.

When the magazine 301 is loaded in a magazine loading section 302, the loading is sensed by a magazine loading detection circuit 303 and a loading detection signal is supplied therefrom to the system controller 304. The output from the variable characteristic circuit 305 is supplied to the characteristic detection circuit 306, which generates the identification signal from the supplied output and sends out the identification signal to the system controller 304. The operations of the system controller 304 are shown in detail in the flowchart of Fig. 18.

As shown in Fig. 20A, a bar code reader 408 is used to relatively easily enter a necessary part of tune content information on the lyrics of tunes, explanatory sentences for the tunes, imaginal pictures for the tunes, etc., contained in a data book offered together with or separately from disks. The entered tune content information is stored in the memory 410 of a magazine-housed disk player through a system controller 403.

tion such as the voices of the reproduced tune and an imaginal picture therefore, is displayed after the selection of the tune, a display surface is efficiently utilized.

Fig. 23 shows a magazine-housed disk player in accordance with another embodiment of the invention. A magazine 501 and an external memory 511 such as an IC card 511 can be optionally loaded in the player. A reproduction program, various kinds of commands, etc., are entered into the control circuit of the player through a remote-control keyboard 507 or a keyboard 513 built into the body of the player.

The constitution and operation of the magazine-housed disk player will be described with further reference to Fig. 24. When the magazine 501 is loaded in a magazine loading section 502, the loading is sensed by a magazine loading detection circuit 503 and a loading detection signal is supplied therefrom to a system controller 504. The system controller 504 is also supplied with a command signal and the reproduction program through the remote-control keyboard 507 or the built-in keyboard 513. The system controller 504 stores the reproduction program in an internal memory 508 or the external memory 511. The stored contents of the memories 508 and 511 are retained even if electric power is cut off from the player. The system controller 504 also functions so that reproduction information such as the reproduction program stored in the external memory 511 and information on a tune to be reproduced is entered if necessary. A disk housed in the magazine 501 is moved to a prescribed playback position in a reproducing section 510 by a disk conveyance mechanism 509. The reproducing section 510 reads an information signal recorded on the disk, and a demodulation output resulting from the demodulation of the read information signal is supplied to a power amplifier (not shown in the drawings) and then to a loudspeaker or a cathode-ray tube (not shown in the drawings). The system controller 4 regulates the disk conveyance mechanism 509, the reproducing section 510 and a display unit 512 for displaying the reproduction information and so forth.

The reproduction of the disk by the magazine-housed disk player is now described with reference to a flowchart shown in Fig. 25. When the electric power is applied to the player and it is commanded through the remote-control keyboard 507 or the built-in keyboard 513 that the player should be put in action, it is judged from the presence or absence of the loading detection signal in a step S1 whether or not the magazine is loaded in the player. When it is judged in the step S1 that the magazine is not loaded in the player, it is shown by the display unit 512 in a step S2 that the magazine should be

loaded in the player. When it is judged in the step S1 that the magazine is loaded in the player, it is judged from the presence or absence of a detection signal from a loading detection switch (not shown in the drawings) in a step S3 whether or not the external memory 511 is loaded in the player. When it is judged in the step S3 that the external memory 511 is not loaded in the player, it is shown by the display unit 512 in a step S4 that the external memory should be loaded in the player. Then it is judged in the step S3 that the external memory 511 is loaded in the player, the reproduction program is entered from the external memory and stored in the internal memory 508 in a step S5. After that, it is commanded by the system controller 504 in a step S6 to search for specific information for a disk in a prescribed position in the loaded magazine or another disk or a plurality of disks and to enter the specific information in a step S7. The specific information may be TOC information or the like, the number of the disk or disks, the number of tunes, a reproduction time, the kind of the tunes, etc., and should serve to identify the disk or disks.

A reproduction program execution command is given to the system controller 4 through the remote-control keyboard 507 or the built-in keyboard 513 in a step S8 to execute the reproduction program. If the reproduction program including the specific information for the disk exists in a step S9, the reproduction program is executed in a step S16. If the reproduction program including the peculiar information for the disk does not exist in the step S9, it is judged in a step S10 whether or not a request to newly create a reproduction program through the remote-control keyboard 507 or the built-in keyboard 513 exists. When it is judged in the step S10 that the request does not exist, the execution of a control program is terminated and the player is shifted to a reproduction mode based on manual operation. At that time, the program area of the memory 508 is cleared to erase the reproduction program already stored therein to prepare for the entry of the newly created reproduction program in a step S11. When it is judged in the step S10 that the request exists, the display unit 512 is commanded in a step S12 to show that the reproduction program should be newly created. When a signal indicating that the entry of the reproduction program is completed is entered through the remote-control keyboard 507 or the built-in keyboard 513 in a step S13, it is judged in a step S14 whether or not a command for storing the reproduction program exists. When it is judged in the step S14 that the command does not exist, the reproduction program is executed in the step S16. When it is judged in the step S14 that the command exists, the reproduction program is

the user or the player to easily select a desired one of the reproduction program. A resistance value selection circuit, a variable output voltage circuit, a digital switch circuit or the like can be used as the variable characteristic circuit 505. An identification code may be provided on the magazine, instead of the variable characteristic circuit 505, so as to be optically read and subjected to photoelectric conversion.

Although the contents of the external memory are previously entered into the magazine-housed disk reproduced in the flowchart shown in Fig. 25, the specific information for the disk may be previously read and only a program including such information may be thereafter entered from the external memory into the player.

A magnetic card, an IC card, an optical card, a magnetic disk or the like can be used as the external memory.

In a magazine-housed disk player provided in accordance with the present invention, reproduction programs for magazines are stored in an external memory so that reproduction by the use of a plurality of magazine-housed disk players or the use of a plurality of magazines can be quickly started because the reproduction program does not need to be newly set for the magazine every time the other magazine is replaced by the former.

Figs. 28 and 29 are block diagrams of a reproduction system for an optical disk player constructed according to a yet further embodiment of the present invention. The block diagram shown in Fig. 28 illustrates a process in which data identifying each magazine loaded in the player is stored. The block diagram shown in Fig. 29 shows a process in which the magazine loaded in the player is identified on the basis of the contents of the stored data. The flowcharts of Figs. 30, 31 and 32 describe these processes in more detail.

The process shown by the block diagram in Fig. 28 will now be described. After the magazine 607 containing one or more disks as shown in Figs. 2 and 3 is loaded in a tray 608, a reproduction switch key is operated to select one of the disks. The selected disk is moved to a play back position. TOC information on the selected disk in the playback position is read. The numbers of desired tunes recorded on the selected disk and the sequence of reproduction of the desired tunes are set in a program. The program and the TOC information are stored in a memory such as the RAM (random access memory) of a microcomputer in the player. If tunes recorded not on the disks in the loaded magazine but on those in other magazines are desired to be reproduced, the latter magazines are loaded in the player in the same procedure as the former magazine to store programs and TOC information in the memory.

After the storage of this data for the magazines is completed, the process shown by the block diagram in Fig. 29 is started. In the process, the magazines are loaded in the player in accordance with a predetermined sequence or desired one of the magazines is loaded in the player. When the first disk selected is moved to the playback position, the TOC information on the disk is read by the player so as to be compared with a plurality of pieces of TOC information previously stored in the memory to identify the loaded magazine. The stored program stored together with the TOC information on the disk is read from the memory so that the desired tunes are reproduced in the designated sequence.

Although the magazine loaded in the player is identified in terms of the TOC information on the first disk in the magazine and the program information is read in the above-described embodiment, the present invention is not limited thereto, and TOC information and program information on an arbitrary disk or disks in the magazine may be stored to identify the magazine loaded in the player at the time of reproduction.

Although TOC information and program information are stored in the above-described embodiment, the present invention is not limited to such an arrangement. If six disks are housed in each magazine and the numbers of the tunes of the disks constitute a relatively random series such as 8, 10, 5, 8, 8 and 10, the series may be stored together with the TOC information. The total time of reproduction of each of the disks may be stored instead of the number of the tunes thereof. In such cases, since TOC information on a plurality of disks needs to be read, such methods are less easy with respect to operation than the method in which the magazine is identified in terms of the TOC information on the single disk in the above-described embodiment.

The program information and auxiliary code information recorded on a disk to identify a magazine may be stored in the memory in the player to identify the magazine.

Not only TOC information or the like for identifying the magazines and program information, but also information on the numbers, etc., of a plurality of magazines may be stored together in the memory in the player.

Although the above-described embodiment relates to a reproduction system for audio disks, the present invention is not confined thereto and may be embodied as a reproduction system for video disks.

In a reproduction system provided for an optical disk player in accordance with the present invention, TOC information or the like on optical disks housed in magazines and prescribed pro-

4 The magazine-housed disk player according to claim 3 wherein each of the identification marks is constituted by a plurality of notches provided in an end of said magazine

5 The magazine-housed disk player according to claim 3, wherein each of said identification marks is constituted by a bar code provided on a side of the magazine

6 A magazine-housed disk player in which, when a magazine containing one or more disks is loaded, and said disks are alternatively pulled out of said magazine and reproduced, comprising:

a variable characteristic circuit and an external connection terminal for detection a variable characteristic of said circuit provided in each said magazine, a characteristic detection circuit having a connection terminal removably connected to said external connection terminal when said magazine is loaded in said player; and

means for effecting reproduction of a disk loaded in said player in a manner corresponding to the output from said characteristic detection circuit.

7 A magazine-housed disk player in which a magazine containing one or more disks and provided with an identification mark is loaded, and said disks are alternatively moved to a reproducing section and reproduced, comprising:

memory means for storing magazine content information indicative of the contents of said disk housed in said magazine.

reading means for reading said identification mark of said magazine loaded in said player so that said magazine content information corresponding to said identification mark is read from said memory means;

tune content information reading means for reading tune content information from a prescribed recording medium; and

display signal generation means by which said read magazine content information and said read tune content information obtained from said reading means are alternatively sent out as display information

8 In a magazine-housed disk player in which a magazine containing one or more disks is loaded, and said disks are alternatively moved to a reproducing section and reproduced in accordance with a reproduction program, the improvement wherein said reproduction programs are stored in an external memory, and the contents of said external memory are read to enter a reproduction command

9 A reproduction system for an optical disk player, comprising: a plurality of magazines, each containing one or more optical disks said magazines being loaded in said player, a memory provided in said player for storing information for said optical disks and program information for the tunes

or said disks and the sequences of reproduction of said tunes.

and means for loading said magazine in said player for reproduction of tunes in said magazine identified in response to said information stored in said memory, so that said tunes are automatically reproduced in accordance with said program information stored in said memory

10 In a disk player in which one of a plurality of magazines, each containing a plurality of information disks, is loaded so that said disks can be selectively reproduced, the improvement comprising:

operation keys for entering numbers of said magazines; and

a display section for showing said magazine numbers entered by said keys

FIG. 4

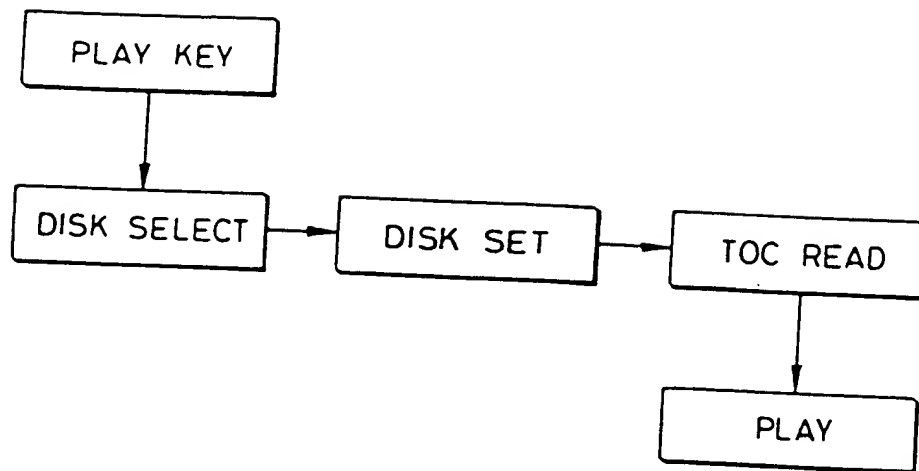


FIG. 5

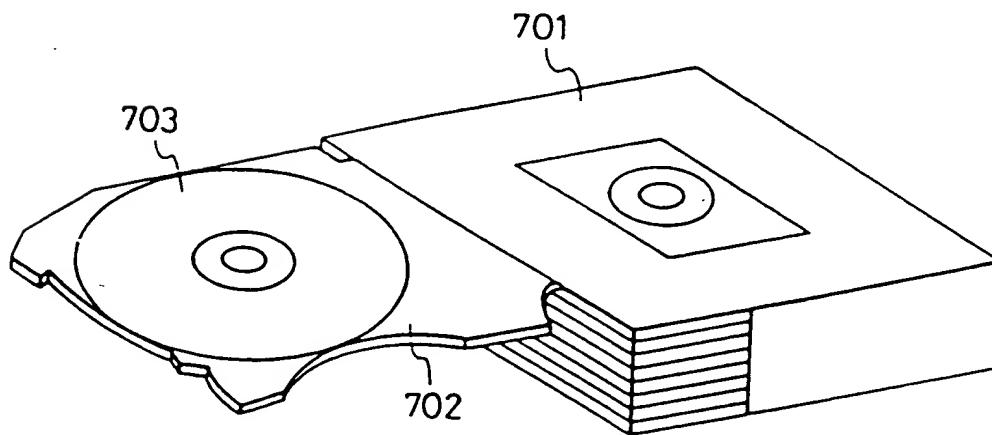


FIG. 8A

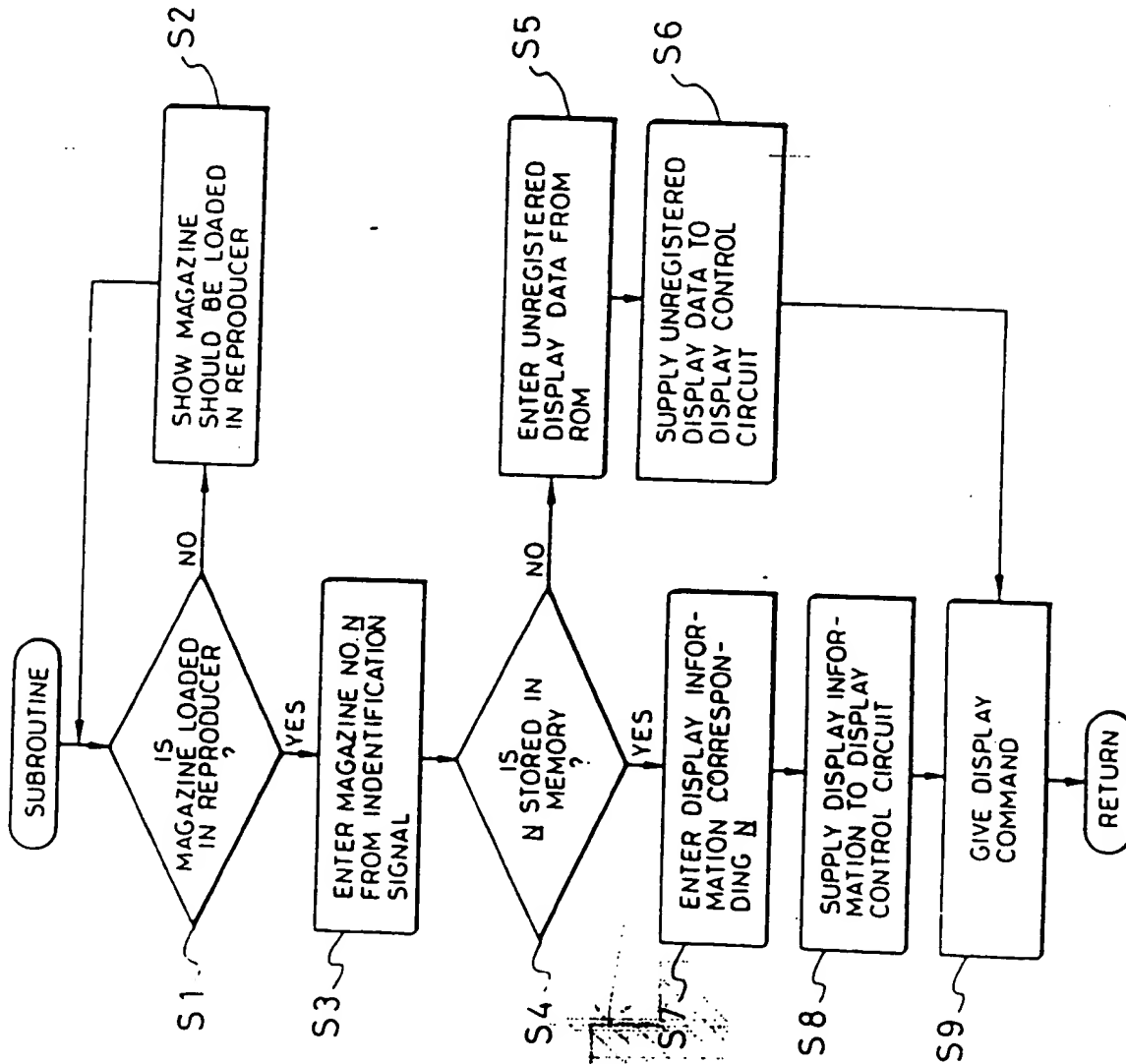


FIG. 8B

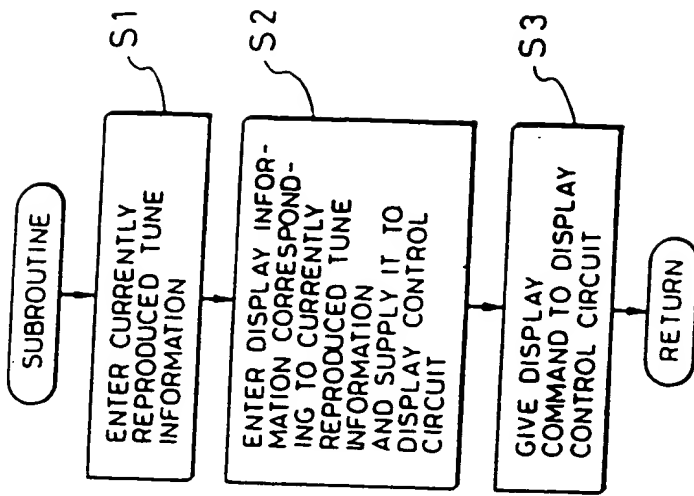


FIG. 9B

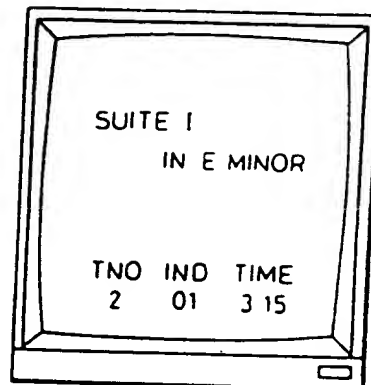


FIG. 9C

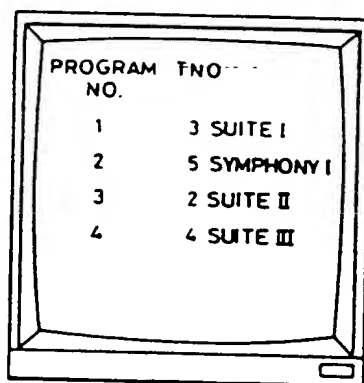


FIG. 9D

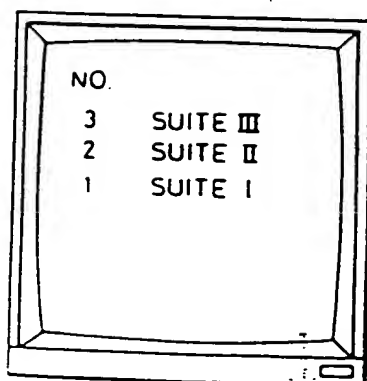


FIG. 9E

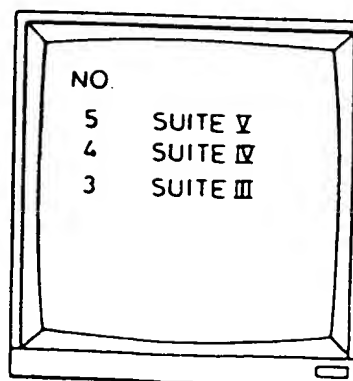


FIG. 12A

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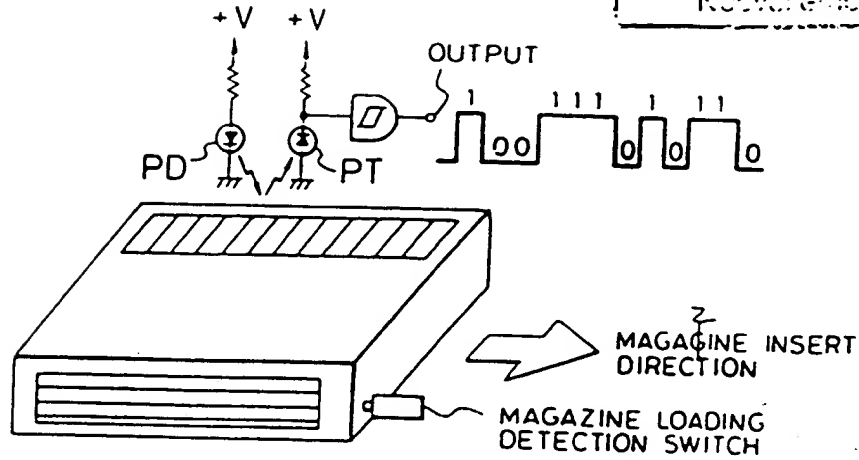


FIG. 12B

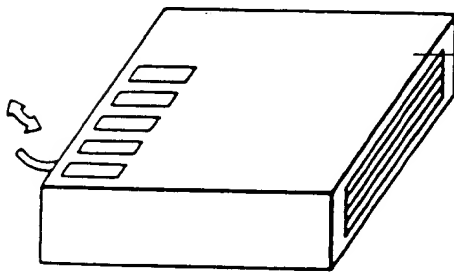


FIG. 12C

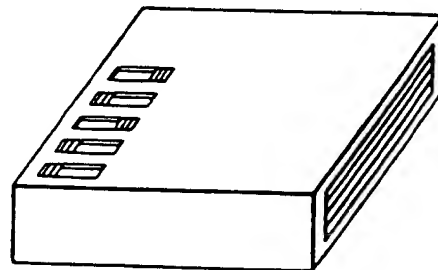


FIG. 13

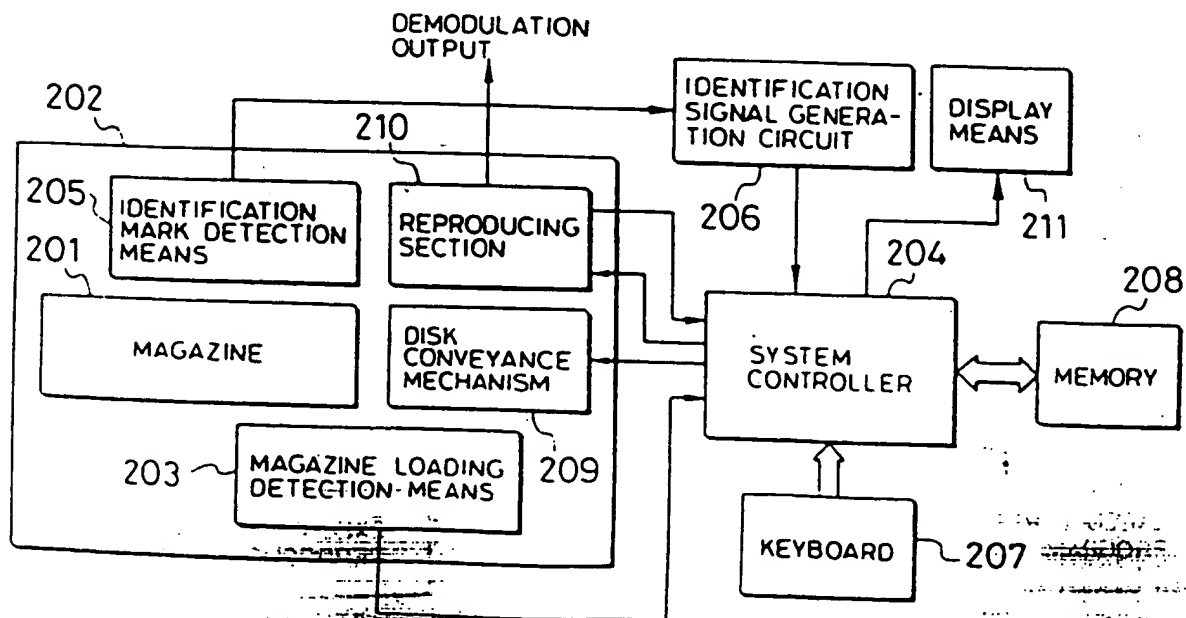


FIG. 15A

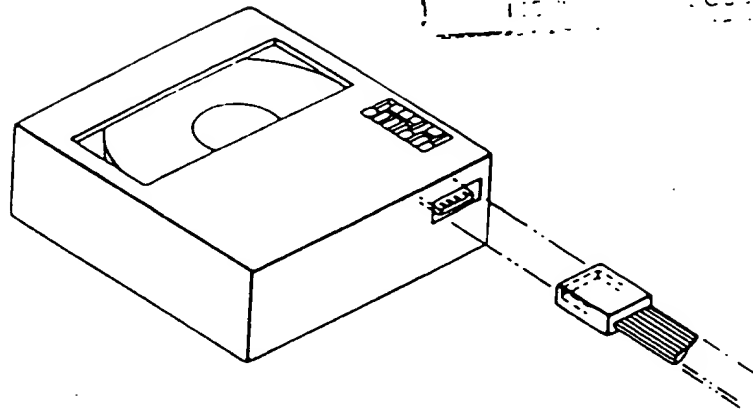


FIG. 15B

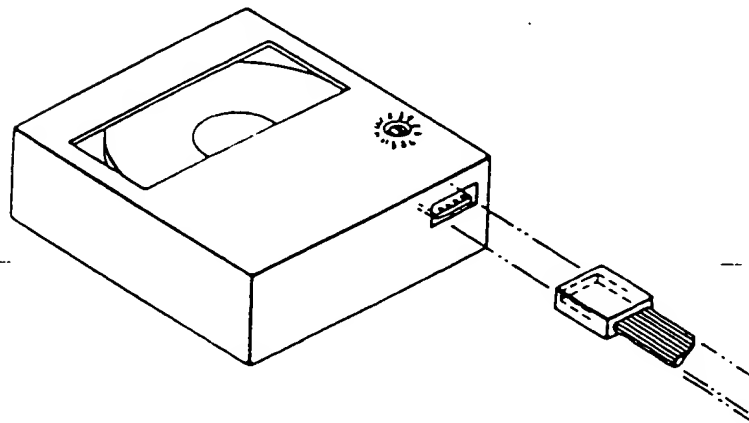


FIG. 17

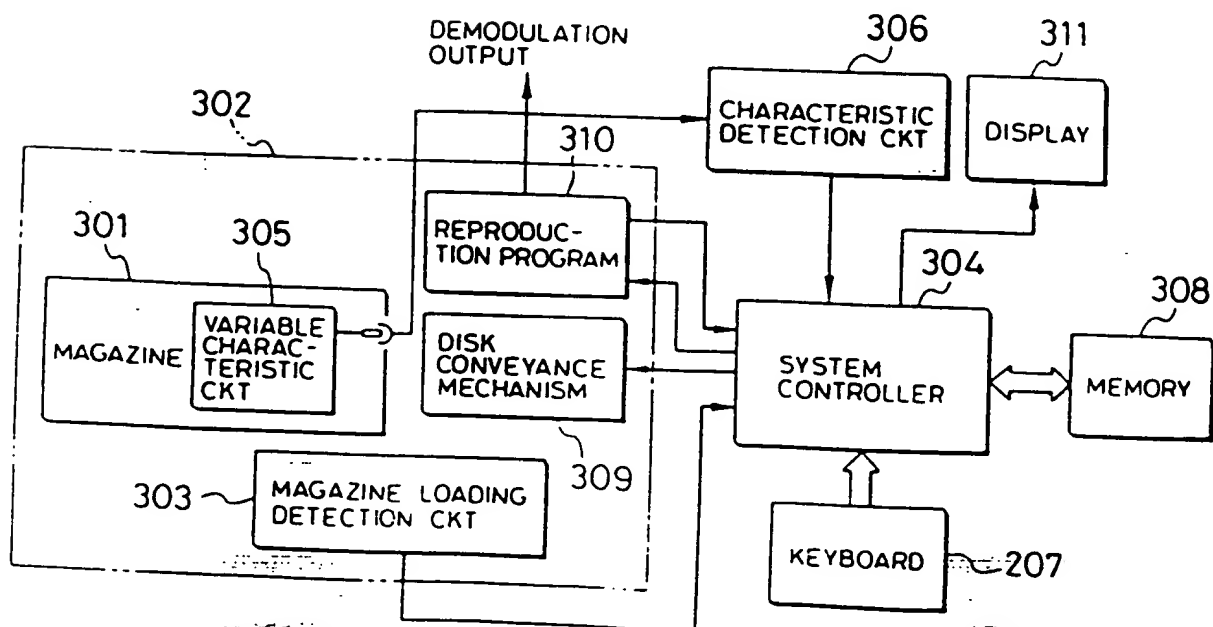


FIG. 18

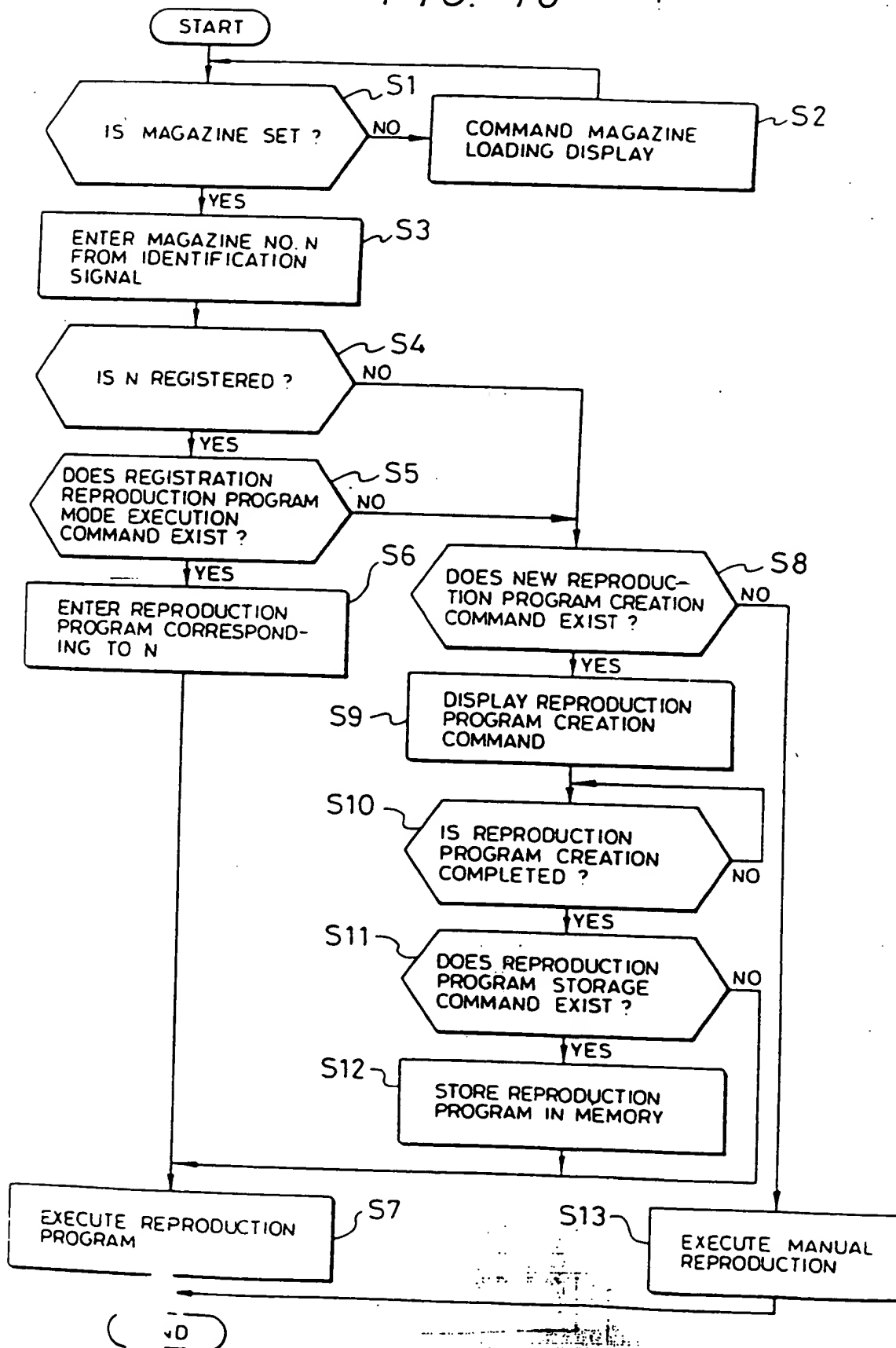


FIG. 20A

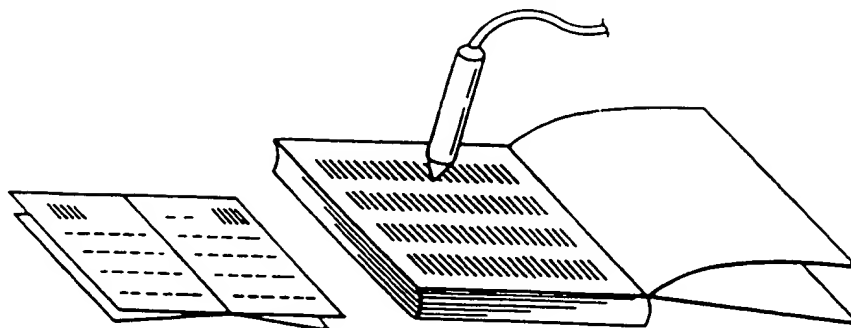


FIG. 20B

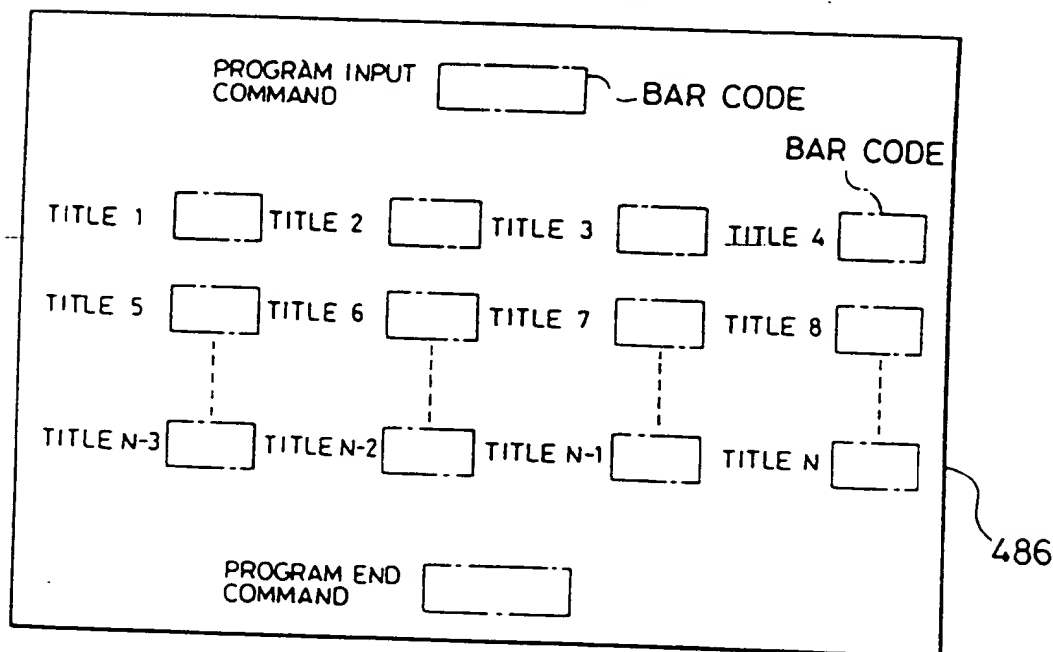


FIG. 20C

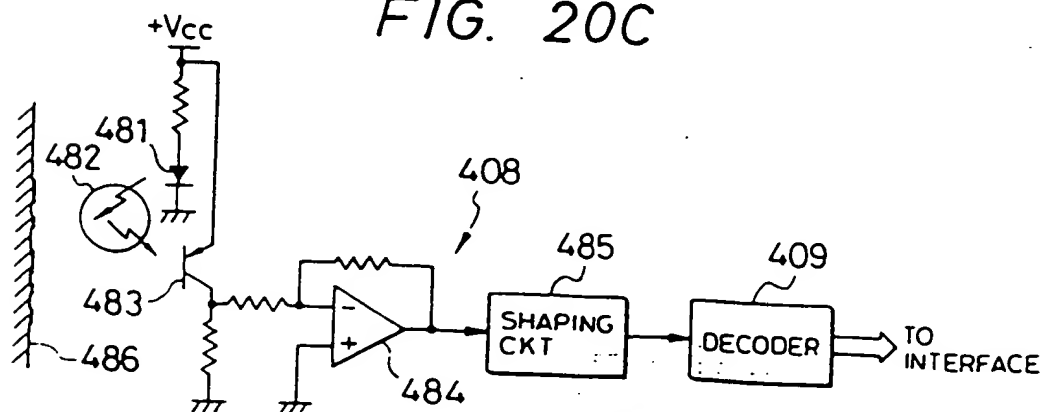


FIG. 23

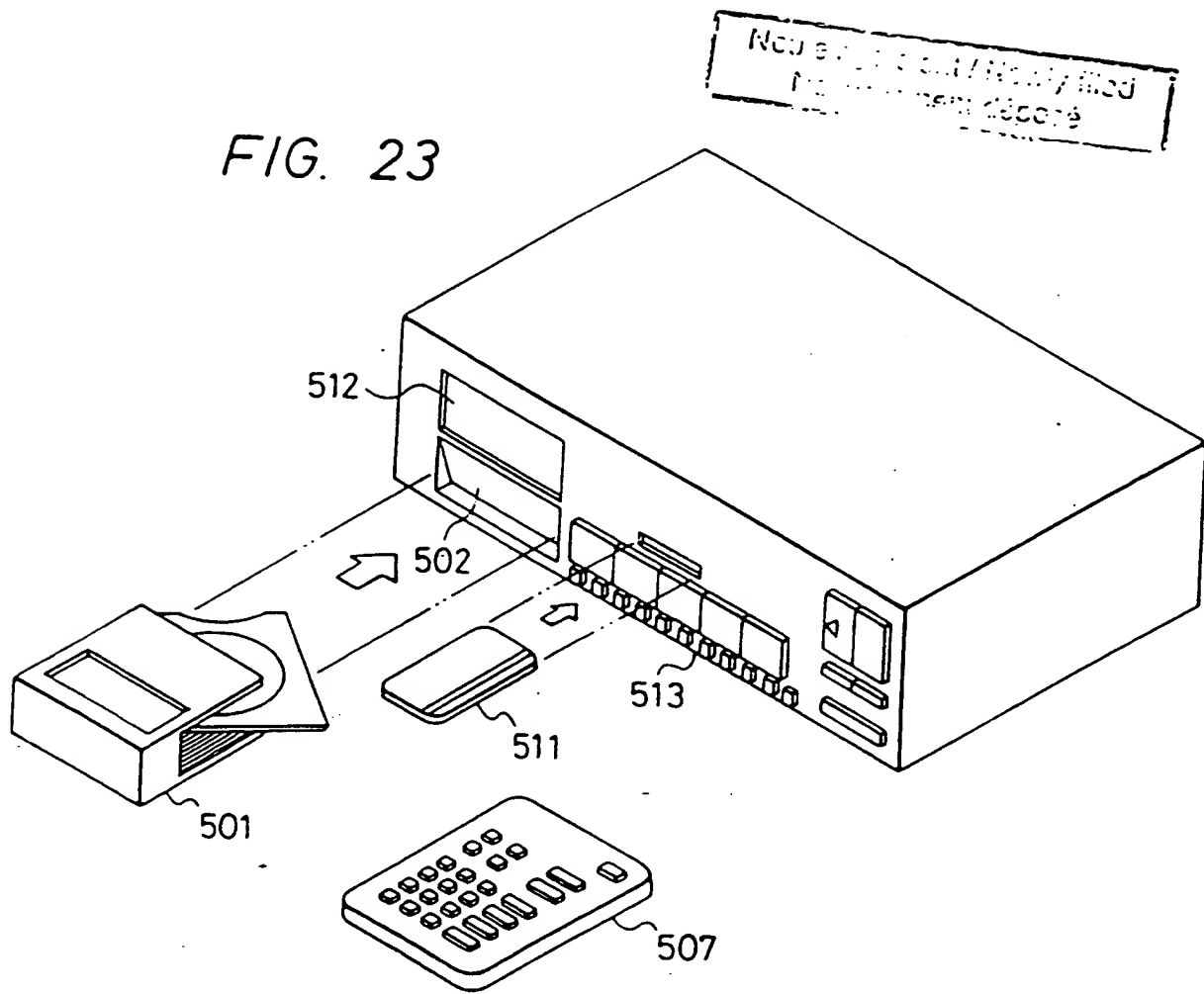


FIG. 24

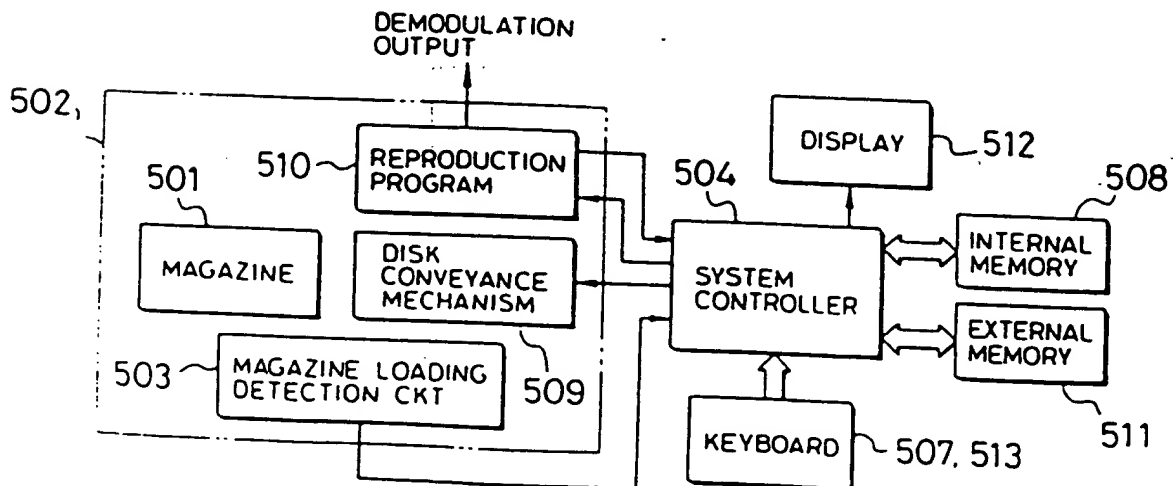


FIG. 26

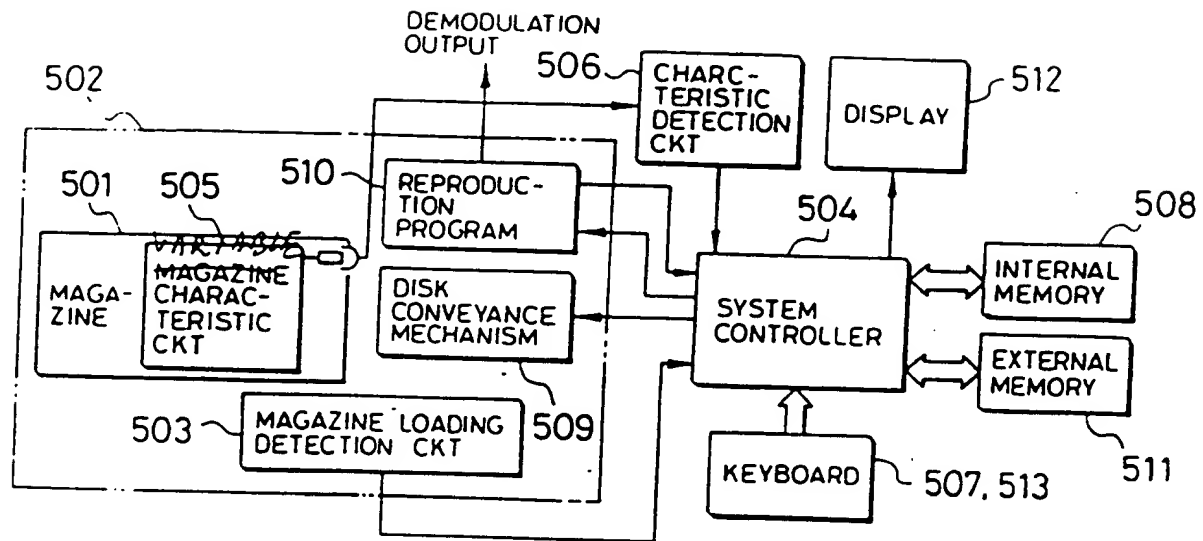


FIG. 28

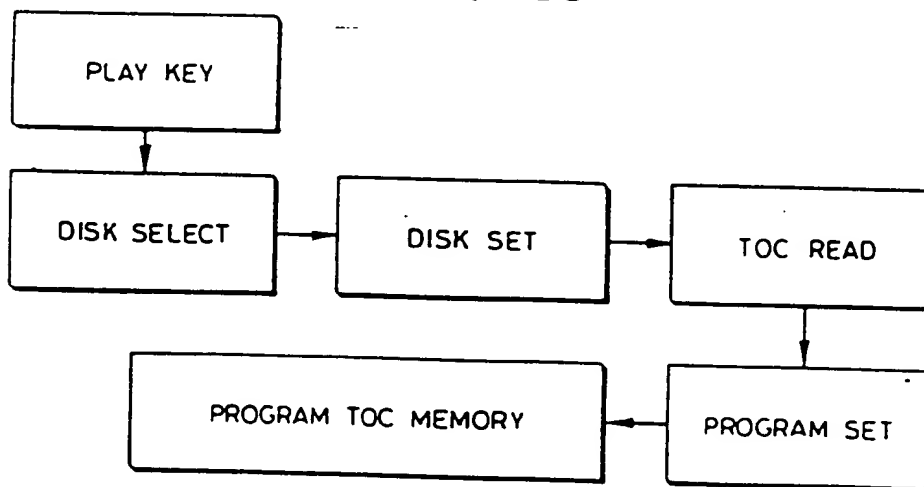


FIG. 29

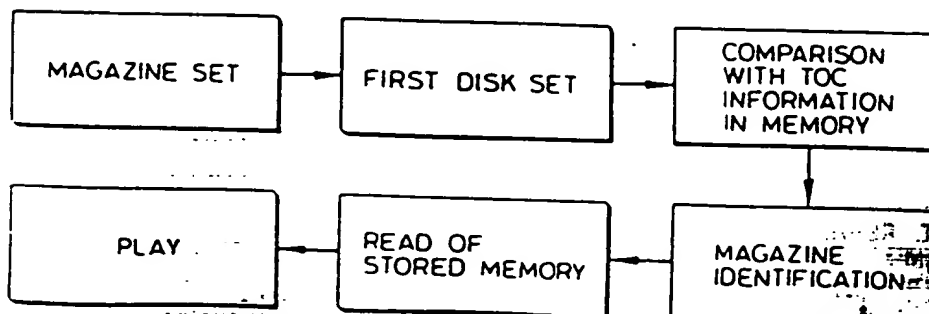


FIG. 30

NEW EDITION / NEW / NEW

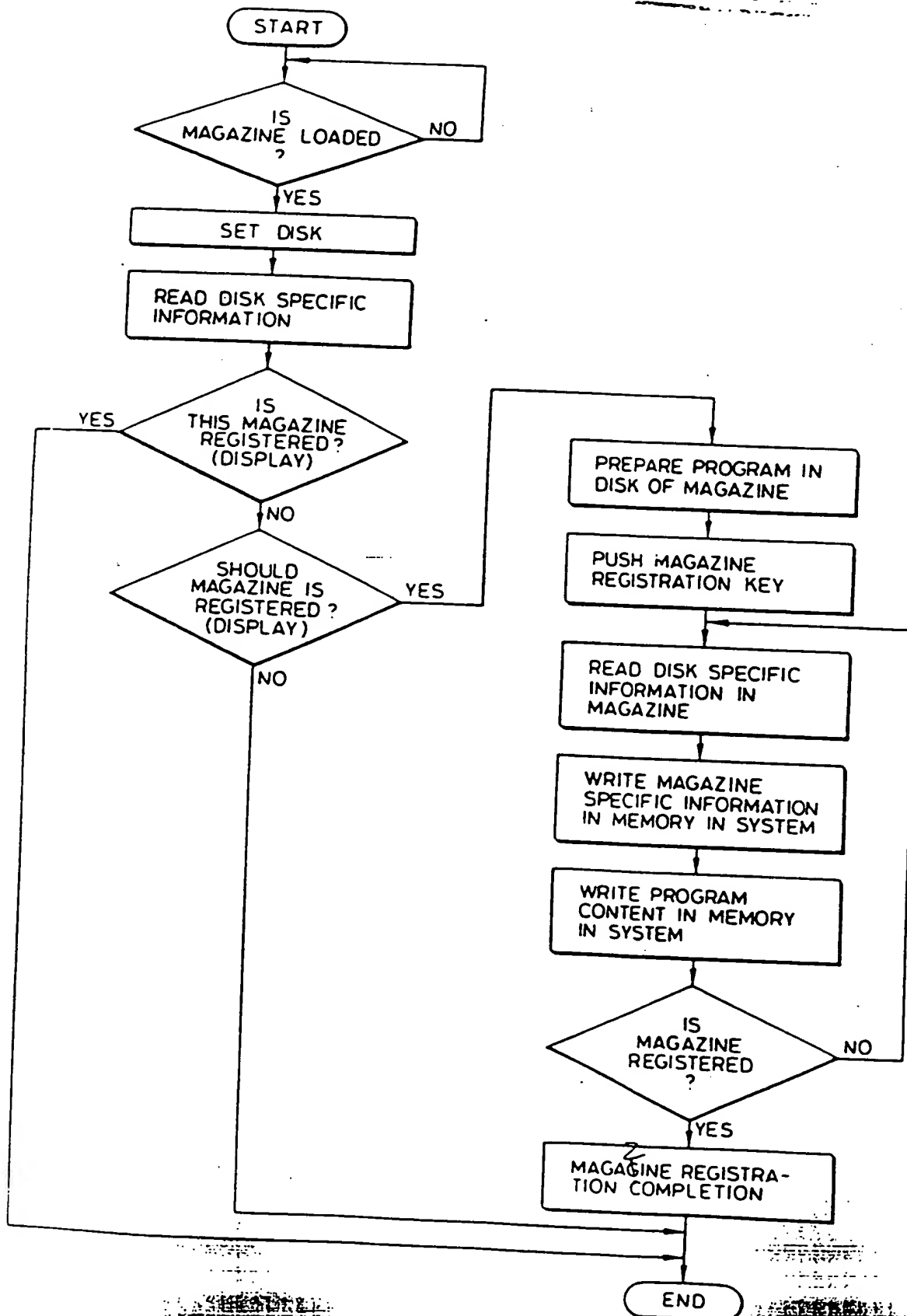
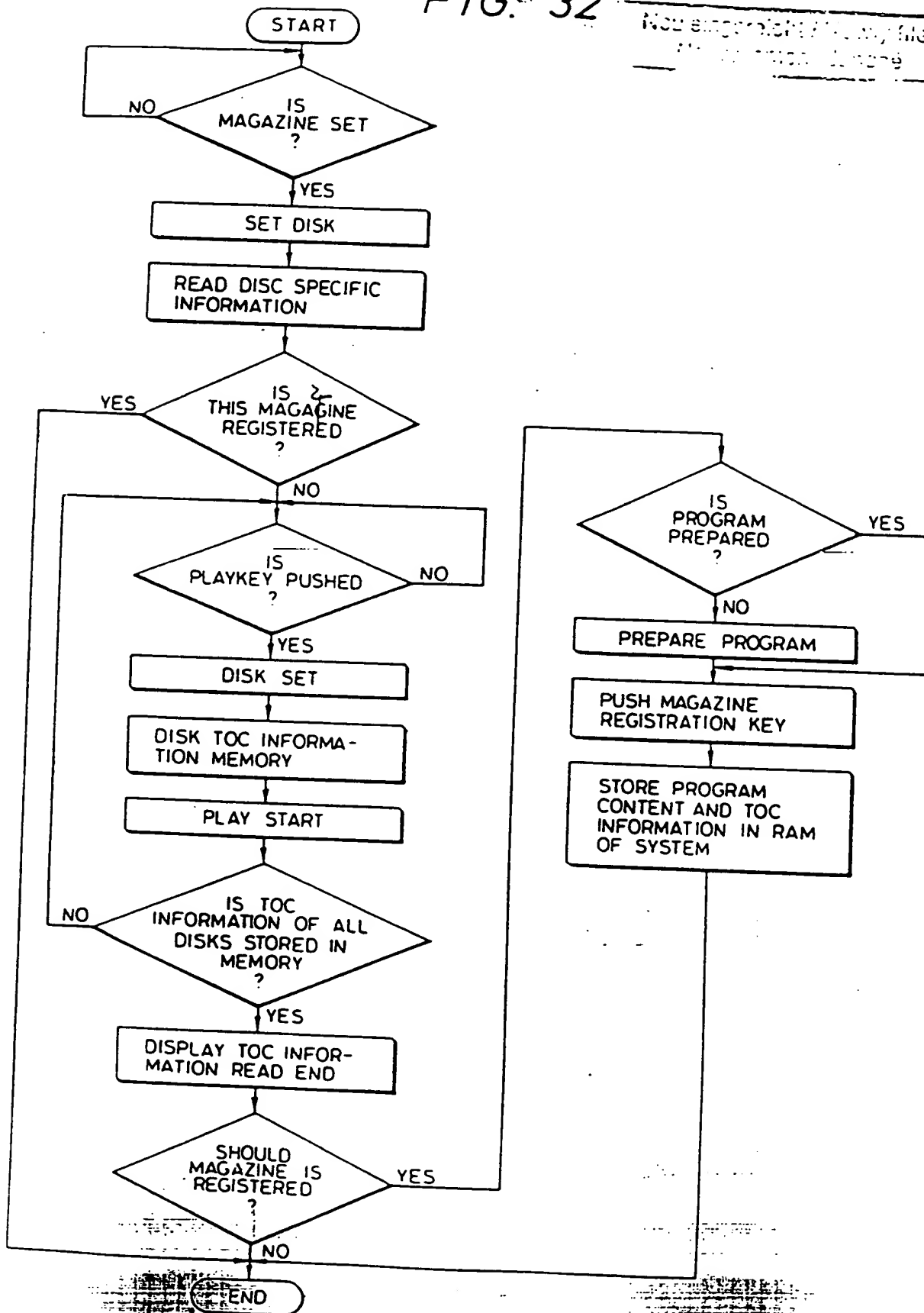
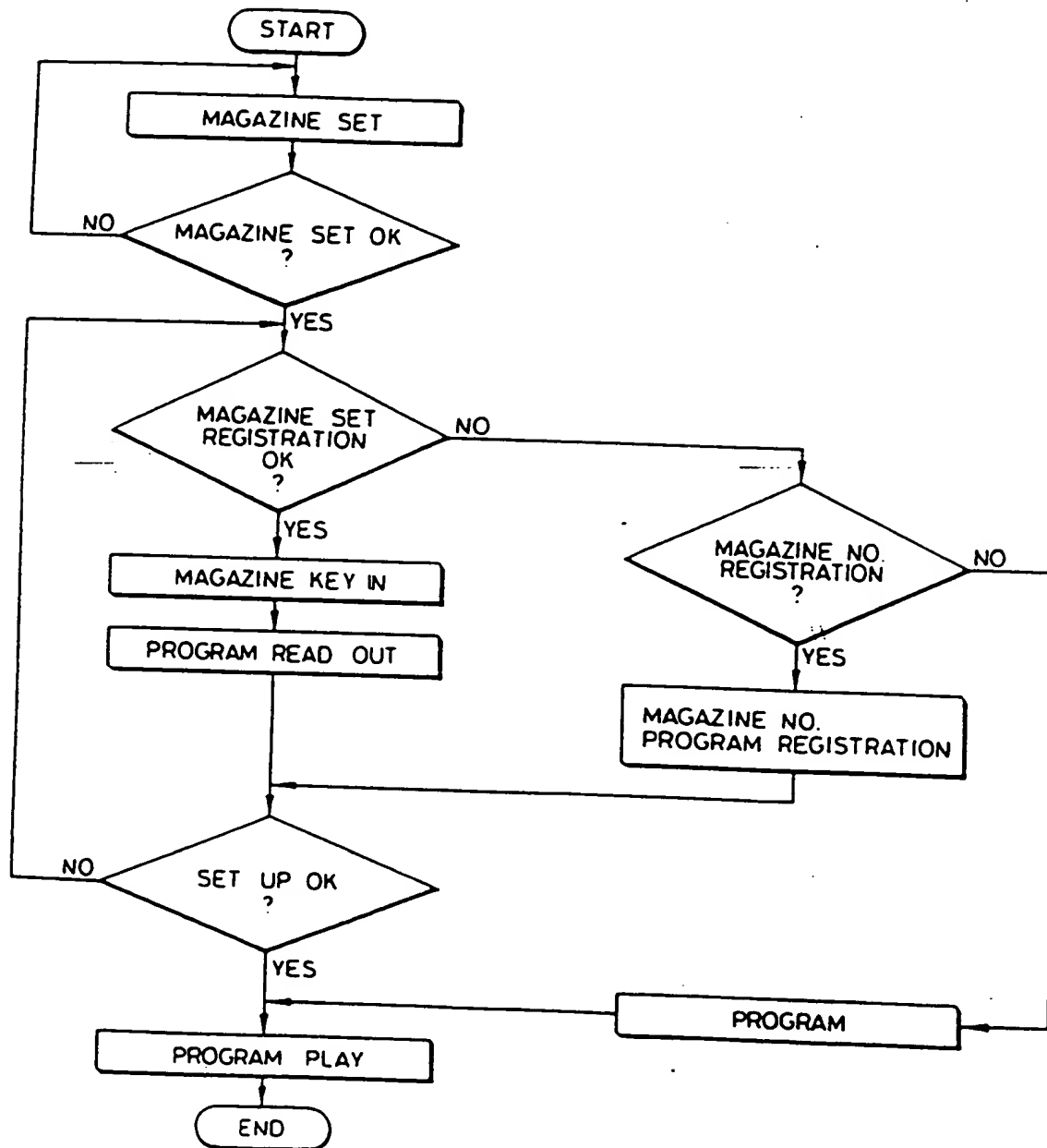


FIG. 32

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FIG. 35



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